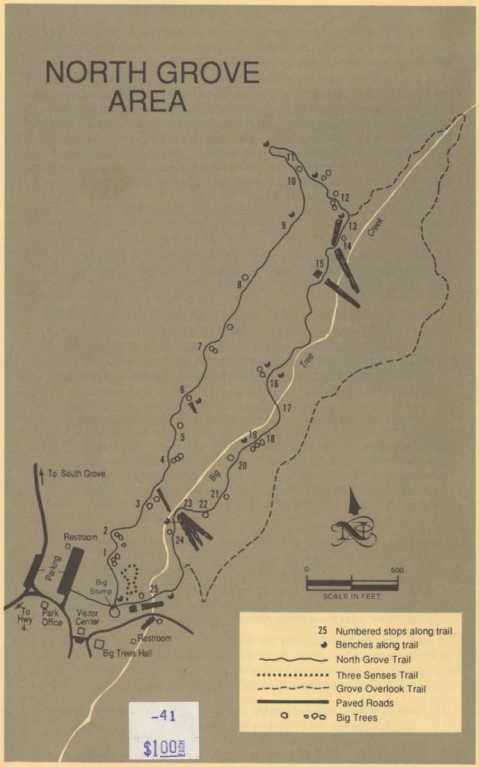
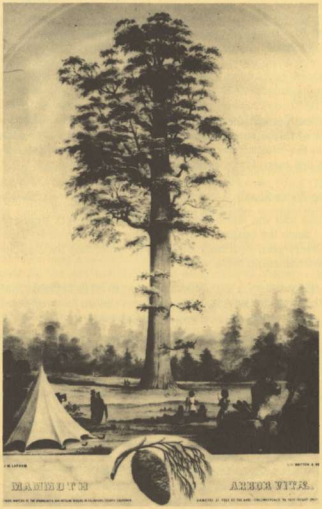




A Guide to the Calaveras North Grove Trail

They [the Calaveras giants] were the first discovered and are the best known. Thousands of travelers from every country have come to pay them tribute of admiration and praise.

—John Muir

Calaveras Big Trees State Park

Welcome to the North Grove of Sierra redwoods at Calaveras Big Trees State Park.

The Trail

The trail through the North Grove is a gentle, well-marked loop about one mile (1.6 km) long. Look for the numbered trail markers that correspond to the numbers in this guide. Allow at least one hour for your walk through this magnificent, historically significant grove.

Before You Start

On this trail you will be walking among the world's largest living objects. Since the beauty of the North Grove is enjoyed by thousands of people every year, your help is needed in protecting the Big Trees and their environment in these ways:

- STAY BEHIND THE FENCES AND ON THE ESTABLISHED TRAIL AND BOARDWALKS. This protects the shallow redwood root systems from erosion and soil compaction.
- LEAVE ALL NATURAL OBJECTS WHERE THEY ARE FOUND. Pine cones are an important food source for squirrels, and even a twig is important in returning nutrients to the soil.
- TAKE ALL LITTER WITH YOU. Litter is not only ugly, it is also harmful to wildlife.

Thank you for your help.

AUDIO TAPES OF THIS GUIDE ARE AVAILABLE ON LOAN FOR VISUALLY IMPAIRED VISITORS. ASK AT THE VISITOR CENTER.

Cover: The Discovery Tree before it was cut down in 1853. Drawn by Joseph Lapham, one of the first owners of the North Grove.

The Big Stump

In the spring of 1852, a backwoods hunter named Augustus T. Dowd was chasing a wounded grizzly bear into an unfamiliar forest. Suddenly he was stopped in his tracks by an unbelievable sight—a tree of monstrous proportions that was easily three times larger than any he had ever seen. Dowd spent the rest of the day exploring the area before returning to his campsite in the hills above Murphy's gold mining camp. Dowd was a colorful character, and his story of the big tree was initially met with scepticism. He finally coaxed a group of men to make the 20-mile trip into the mountains to see the tree for themselves.

Almost immediately, visitors began traveling up the rough trail to what became known as the Calaveras North Grove. Word of the "Tree Giants" soon spread throughout the world. Although Dowd was not the first person to have seen them, it was his discovery that sparked the worldwide fascination with the mammoth trees.

In 1853, the year after Dowd's discovery, the very tree he had first seen was stripped of its bark and felled by ambitious speculators. Since no saw was large enough, the tree was felled with other tools of that era—long-handled pump augers and wedges. You can see the marks made by the augers on the fallen part of the tree. It took five men 22 days to drill all the holes, but the perfectly symmetrical tree did not fall for several days.

The bark was assembled into the original form of the tree for a traveling exhibit, but was destroyed by fire one year later. The stump was planed smooth to serve as a dance floor, and a two-lane bowling alley and saloon were built on the fallen trunk. Although these attracted many visitors, others, including Dowd, protested the destruction of this majestic tree. John Muir, one of our country's earliest preservationists, was so angered by these events that he wrote *The Vandals Then Danced Upon The Stump!*

On the cover of this guide is a drawing of this tree as it may have looked before it was felled. Called the Discovery Tree, it was the largest tree in the North Grove. It was over 24 feet (7.3 m) in diameter at the base, and 300 feet (91 m) tall. When the rings were counted, it was found to be only 1,244 years old—relatively young for such a large redwood. Its recent annual growth rings were large, indicating that it was growing very quickly. It is believed by many that if this tree had been allowed to live, it might rival the largest of the Sierra redwoods.

1 The platform was built near this group of redwoods so that you can have a close-up view of these ancient giants. Sierra redwoods (also known as giant sequoias) are the largest objects to have ever lived on the earth. The fossil record of the redwood family dates back 180 million years to the age of the dinosaurs, and individuals can live over 3,000 years. Once widespread, they now grow naturally only in 75 groves on the western slope of the Sierra Nevada.

Gently touch the soft, fibrous bark. This thick, protective material is one of the keys to the long life span of Sierra redwoods. It often grows to be two feet (60 cm) thick, lacks resin, and contains high amounts of the chemical

tannin, thereby providing effective protection from fire. Tannin also protects against diseases that affect other types of trees in this area.

Sierra redwood bark is used by animals in several ways. Torn strips of bark are used as nesting material by the small tree squirrels called *chickarees*, as well as several types of birds. Carpenter ants chew tunnels in the bark that are used as brood chambers for their larvae. Red-breasted sapsuckers drill holes in the thin bark near the tree tops and return later to feed on the insects caught in the sap. Several types of animals roll in the tannin-filled bark dust at the base of the trees that is thought to repel parasites such as lice and fleas.

2 This group of trees is named for Desire Fricot, a leader in the campaign to establish lasting protection for the Sierra redwoods. The North Grove is now a state park due to the foresight and hard work of early preservationists such as Fricot. Although discovered in 1852, it did not come under the protection of the State Park System until 1931. During the intervening years, the ownership of the grove changed hands several times, until it was purchased by a lumberman named Robert P. Whiteside in 1900. Although he made a gentleman's pledge to not log the grove, the public began to press for government protection. As you walk through the grove, realize that we are among the future generations for whom this forest of giants was preserved.

3 The Sierra redwoods on the right are two of the largest in this grove, with diameters of over 17 feet (5.2 m) at 4.5 feet (1.36 m) above the ground. The very largest trees grow in the southern part of their range in Sequoia and Kings Canyon National Parks, where they reach heights of up to 310 feet (94 m) and diameters of up to 30 feet (9 m). Try comparing those dimensions with the size of a room in your house, your classroom at school, or the length of a football field.

4 This group of redwoods, named for the Three Graces of Greek mythology (Aglaia, Euphrosyne, and Thalia), may have started life together when fire or a falling tree provided access to the mineral soil and sunlight needed by the tiny seeds. There are two types of redwoods in California: Sierra redwoods—the world's largest living things; and coast redwoods—the world's tallest living things. Although these trees are related, they differ in many ways. One difference is that the Sierra redwoods reproduce only by seed, while the coast redwoods can also reproduce by sprouting from their roots, burls, and stumps.

5 Although the thick redwood bark does not burn easily, this large fire scar shows that with enough heat, the bark will burn. You can tell that this scar is in the process of healing because of the bark growing over the blackened wood.

Sierra redwoods evolved in the presence of fire, and have not only adapted to it, but depend on it in several ways. Heat from fire causes the cones to open and release the seeds. Fire clears the ground of duff, litter, and brush so the tiny seeds can reach mineral soil and receive plenty of sunshine.

A tree that lives 2,000 years may live through 100 fires. Sierra redwoods are able to survive these fires because of their protective bark, branches that grow high above the ground, and widened bases that cause other burning trees to roll off if they fall against them.

With the settlement of the West, these frequently occurring fires began to be suppressed. This led to higher amounts of fuel on the ground, resulting in uncontrollable and destructive forest fires. At Calaveras Big Trees, we are trying to recreate the pre-settlement conditions with the use of prescription burning throughout the park. A prescribed burn is a carefully planned and administered fire, set only when conditions allow it to be easily controlled. Not only does this reduce the danger of huge wildfires, but has resulted in large areas of Sierra redwood seed germination.

6 The Calaveras North Grove was a popular, easily accessible destination for tourists starting as early as the 1850s. As the roads to Yosemite improved, Yosemite Valley and the nearby redwood groves began to attract increasing numbers of visitors. Because of this competition, when the Wawona Tunnel Tree in Yosemite was carved out in the 1880s, the owners of the North Grove responded by doing the same to this tree.

The Pioneer Cabin Tree was chosen because of its extremely wide base and large fire scar. Because of the huge cut, this tree can no longer support the growth of a top, which you can see lying on the ground if you walk through the tunnel. The opening has also reduced the ability of this tree to resist fire. A few branches bearing green foliage tell us that this tree is still managing to survive.

7 You may have noticed that not all the trees here are redwoods. Sierra redwoods do not grow in pure stands as do the coast redwoods, but exist as part of the Sierra mixed-conifer forest. This is an interrelated community of plants and animals that lives between about 2,000 and 7,000 feet elevation on the western slope of the Sierra Nevada. Plant and animal distribution in the Sierra is controlled by altitude, rainfall, temperature, slope, aspect, and soil type. Since much of this community has been logged elsewhere, the large conifers found in the grove are now rare outside parks and preserves. The most common trees of this community are illustrated below. How many can you find?

SUGAR PINE *Pinus lambertiana*

SIERRA REDWOOD *Sequoiadendron giganteum*

WHITE FIR *Abies concolor*

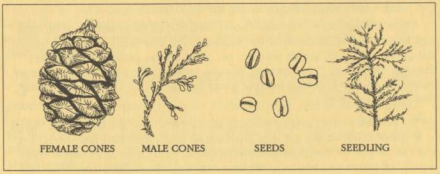
INCENSE CEDAR *Calocedrus decurrens*

PONDEROSA PINE *Pinus ponderosa*

8 A common practice of earlier times was to name individual "Big Trees" after important people. This beautiful, symmetrical tree was named for Abraham Lincoln just after his death in 1865. If you could name some of these trees, what would you choose?

On the ground around the tree you will see many of the egg-shaped female redwood cones. It takes two years for each cone to mature. The much smaller male cones in the tree tops contain pollen that is blown around the grove during the spring. The pollen must come into contact with new female cones for the seeds to be fertilized. The seeds resemble a flake of oatmeal, and it takes 6,000 to weigh just one ounce (215 seeds/g).

After they mature, the cones can stay on the tree over 20 years until they are acted upon by some outside agent, such as fire, wind, snow, harvesting by chickarees, or insect activity. A large tree may bear as many as 40,000 cones at once, opening about 1,500 each year. With each cone containing an average of 200 of the tiny seeds, these trees have the potential of producing enormous numbers of seedlings, but only if the conditions are right.



Display: *Ambassadors From Another Time*

9 Read the display for information about the past and present distribution of the Sierra redwoods. From here you have a view into the heart of the grove, which has been at this site for thousands—perhaps millions—of years. Notice the rounded crowns and large branches that are typical of the older redwoods. The large trees you see here could be anywhere from 800 to 3,000 years old.

Display: *A Sacrificial Tree*

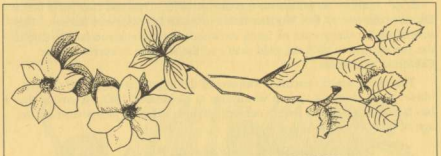
10 The display tells the story of this blackened snag called the Mother of the Forest. When speculators removed the bark from this tree, it was mortally wounded. The layer of tissue just under the bark carries manufactured sugars throughout the tree. With this layer removed, the tree could not survive for long. With the outer layer of protective bark gone, the tree lost all its resistance to fire, as can be seen by the wood blackened in the fire of 1908. If you look closely you can still see the horizontal saw marks in the wood that were made in removing the bark.

11 You are now in an area that was burned in the 1908 fire. The fire created ideal growing conditions for Sierra redwood seedlings, and today there is a healthy stand of young redwoods here. Look for their red-dish bark and feathery, juniper-like foliage. Some of the young redwoods are already close to 100 feet (30 m) tall with over two-foot (60 cm) diameters, while others of the same age are still small and scraggly. Eventually the smaller trees will die, leaving only the faster-growing individuals. These trees have reached the age when they can begin producing cones with viable seeds.

The open area you crossed just behind the Mother of the Forest is a side route of the Carson-Emigrant Trail. Snowshoe Thompson used this route during his 20 years of carrying mail from Murphys to Carson City. During the winters of 1856-1876 he regularly skied the 90 miles (144 km) over the Sierra crest carrying 60 pounds (27 kg) of mail and little else. This is also called the old Camel Trail as a group of nine Bactrian camels imported from Mongolia passed through here in 1861 on their way to Walker, Nevada.

12 The large growths on these trees are called *burls*. They form in response to disease and injury. This group has also been affected by fire. Fuel often builds up between closely growing trees, causing large burn scars when ignited.

On the next section of trail are stands of mountain dogwood and hazel-nut, both important food sources for squirrels and chipmunks. Hazelnut is the shrub with soft, fuzzy, tooth-edged leaves. In the fall you may see the tadpole-shaped hazelnuts hanging from the branches. Mountain dogwoods grace the grove with showy white flowers in the spring, red-orange berries in late summer, and brilliant foliage in the fall.



Grove Overlook Trail

The trail to the left is a slightly longer, alternate route back to the Big Stump. It climbs part of the way up the ridge to provide views of the upper levels of the trees. There are no interpretive markers on the Grove Overlook Trail.

13 The Father of the Forest fell to earth long before Euro-Americans discovered the grove. The process of decomposition occurs very slowly in redwoods because of the tannin in their heartwood. You can think of this tree as a huge time-release vitamin capsule, slowly replenishing the soil. Already it has made an excellent seed bed for mosses, shrubs, and a dogwood tree. Walk inside the tree and see if you can figure out what caused it to be hollow.

This tree has always been a favorite setting for photographers. Early photos show a brass band and troop of cavalry posed on top of the trunk, and people poking their heads through the holes where massive branches once grew.

14 By looking at these roots, you can see that mature Sierra redwoods have a shallow spreading root system rather than a taproot. The roots extend only six to eight feet (1.8-2.4 m) under the soil surface, yet can grow outwards to encompass an entire acre (0.4 ha). This allows the small feeder roots to collect water and nutrients from the rich Sierran soil and support the growth of these huge trees. Redwood seedlings spend the first few years of life developing a strong root system before putting energy into their above-ground development. Several plants—including a young Sierra redwood—are growing in the soil left behind in the roots of this fallen tree.

The long life span of these trees is partly due to the stable structure of their symmetrical trunks and wide bases. However, if the trunk is weakened by large burn scars, or the root system affected by erosion or fungus, they can topple in a heavy wind. Falling over is one of the few things that can actually kill a Sierra redwood.

15 John M. Wooster, one of the early explorers to visit the grove, carved his initials on this tree in 1850. That was two years before Dowd's "discovery," but Wooster failed to make his discovery known. The several earlier discoveries of Sierra redwoods went unnoticed largely due to the preoccupation with the gold rush and the struggle to survive in the California wilderness.

This tree, named Hercules, was one of the largest in the grove. It was blown down during a violent windstorm in December, 1861. Knowing that it has been lying here for over a century gives us valuable perspective on the age of other fallen trees in this grove.

Display: *The Small World of a Big Tree*

16 The display panel at this stop describes the variety of life that is found in the vertical world of the redwoods. After reading the panel, take a few minutes to relax on the reclining bench and observe the life supported by these trees. Some people think that this is the best way to see a Sierra redwood.

These two trees were named the Mother and Son because of their difference in size, yet they probably began life at about the same time. The Mother has been more successful, while the Son has lost much of his top to wind or lightning.

17 You have just crossed Big Tree Creek, which drains the North Grove basin. Although this creek is tiny, it is able to support a population of native trout. Sierra redwood groves are always located near a reliable source of water.

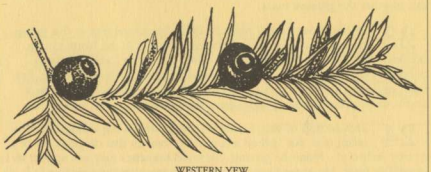
In a few steps you can see the Old Bachelor standing on the hill above the trail. The massive, gnarled branches tell us that this tree is quite old. With increasing age and girth, it becomes more difficult for a Sierra redwood to support the growth of a top. The Old Bachelor's top has died, and will eventually be knocked off by wind, lightning, or heavy snows, leaving the tree with a rounded crown more typical of a very old Sierra redwood.

Notice how the woodpeckers have chosen a particular section of bark in which to drill their holes. This could be due to previous damage to the tree that has resulted in thin bark growing in this area, making it easier for woodpeckers to excavate.

In order to retain unobstructed views of the trees, fences have not been placed on this section of trail. Please help us protect the trees by staying on the established footpath. Thank you.

18 The small trees with dark green needles near the trail are western yew. The North Grove is the only place where Sierra redwood and western yew grow together. This is the southernmost extent of the yew's distribution, and close to the northernmost extent of Sierra redwood distribution.

Yew is also unusual in that each individual plant is either male or female. This type of plant is called *dioecious*, meaning "two houses." Most conifers are *monoecious*, with their male and female parts on the same plant, or "one house." In the fall look for the small salmon-colored berries that grow on the female plants.



WESTERN YEW
Taxus brevifolia

19 The Siamese Twins started life so close together that the first 50 feet (15 m) of their trunks have merged and now appear to be one tree. Large burn scars were created by burning fuel that was caught between the two trees.

Look for a horizontal cut in the bark on the tree to the right of the twins. This was probably the location of one of the marble name plaques which were placed on many of the trees starting in the early 1860s. Bark and wood were also collected from the trees for souvenirs such as pincushions, candle holders, and carved animals. In some groves the bark was removed and shredded for house insulation.

20 The huge base of the Granite State Tree hardly seems like a living, growing organism, yet the activity of life is quietly occurring throughout this tree except during the coldest part of the winter. Tiny feeder roots beneath your feet and up to 150 feet (45 m) out from the base of the tree are collecting water and nutrients from the soil. Water and nutrients are being transported up towards the crown through the sapwood. Sunlight energy is being converted to sugar through the process of photosynthesis in the green foliage. Those sugars are being carried down through a thin layer of wood just beneath the bark to nourish the entire tree.

21 This tree twists noticeably to the right. Spiral growth is a common characteristic of tree trunk development, although bark patterns often hide this fact. Trees with spiral growth are more flexible, and therefore better able to withstand wind stress and snow loading. Spiral growth patterns are prevalent throughout the natural world, taking shape in such forms as snail shells, sheep horns, and even entire galaxies. Can you find any other spiral patterns in the forest?

22 Known as the Empire State, this majestic old tree is now probably the largest Sierra redwood in the North Grove. Its base diameter is 30 feet (9 m), while 4.5 feet (1.36 m) above the ground the tree is about 20 feet (6 m) in diameter, and at 48 feet (14.6 m) above ground it is still 16 feet (4.9 m) in diameter. Though there may be taller trees in the grove, this one has the greatest mass.

23 During a September night in 1965, the central tree in this group became the most recently fallen redwood in the North Grove. Weakened by heavy winds, it crashed down with such force that many people thought an earthquake had occurred. A large tree such as this has been estimated to weigh about 2,600 tons (2,340 t)—about as much as a small ocean-going freighter, or 18 great blue whales.

24 This section of wood lying on the ground is big enough to be a fallen tree, but instead is a piece of branch that dropped off of a nearby redwood. From the ground, redwood branches may not appear to be incredibly large, but some have been found to measure over six feet (1.8 m) in diameter.

25 By looking downstream, you can see the cuts made in the log of the Discovery Tree where the supporting beams were placed for the saloon and bowling alley.

If you look upstream from this bridge in the early spring, you can often see the bright red snow plant, so named because it is the first plant to appear as the winter snows begin to melt. Snow plants lack the chlorophyll that causes most plants to be green and do not photosynthesize, instead resembling a thick stalk of red asparagus. Through recent research botanists have discovered that snow plants attach themselves to the roots of conifers. Although little is known about this relationship, it may be mutually beneficial, enabling the trees to absorb more water and nutrients from the soil. Please do not pick this rare, protected plant.

We hope you have enjoyed your walk through the Big Trees in the Calaveras North Grove. We think you will agree that the words John Muir wrote about the North Grove in 1876 still hold true today:

To the free mountaineer all the woods are accessible alike from the firs that girdle icy Shasta to the giant forests of the Tule; but the... timebound must follow ways and means, and I know of none better than those of Calaveras... a flowery glade in the very heart of the woods, forming a fine center for the student, and a delicious resting place for the weary.

For more information about Sierra redwoods or the park in general, please feel free to contact the park staff or stop by the Visitor Center where exhibits and publications about the park are on display. Two of the publications used in writing this guide may be purchased in the Visitor Center. These excellent books are: *The Enduring Giants,* by Joseph Engbeck; and *Giant Sequoias,* by Harvey, Shellhammer, Stecker, and Hartesveldt.

This guide was written by Wendy Faris, Interpretive Specialist for the Calaveras Big Trees Association. Parts of this guide are based on previous work by Joseph Engbeck, Research Writer for the California Department of Parks and Recreation. The illustrations were done by Peggy Carkeet, a teacher and artist from Twain Harte, California.

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